

What is claimed is:

5        1. A transparent amorphous silicon dioxide film containing a large number of fine voids and showing a refractive index for light at  $\lambda = 500$  nm in the range of 1.01 to 1.40, wherein 80 vol.% or more of the fine voids have diameters of 5 nm or less.

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2. The amorphous silicon dioxide film of claim 1, which has a void volume ratio of 50% or more.

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3. The amorphous silicon dioxide film of claim 1, wherein 80 vol.% or more of the fine voids have diameters of 2 nm or less.

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4. The amorphous silicon dioxide film of claim 1, wherein 90 vol.% or more of the fine voids have diameters of 2 nm or less.

5. The amorphous silicon dioxide film of claim 1, which is a product obtained by firing a film formed according to a sol-gel process.

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6. A process for preparation of the amorphous silicon dioxide film of claim 1, comprising the steps of:

30        subjecting a silicon alkoxide to hydrolysis and condensation-polymerization in an alcoholic solvent in the presence of water and at least one compound selected from the group consisting of hydroxyaldehyde compounds, hydroxycarboxylic acid compounds, allyl alcohol compounds and hydroxynitrile compounds, to prepare sol;

35        forming the sol to produce a film, and  
              firing the film.

7. The process of claim 6, wherein the step for subjecting the silicon alkoxide to hydrolysis and condensation polymerization is performed further in the presence of at least one salt catalyst selected from the

5 group consisting of salts between weak acids and weak bases, salts of hydrazine compounds, salts of hydroxyl-amine compounds and salts of amidine compounds.